# Women and Ischemia Syndrome Evaluation (WISE)
# Diagnosis and Pathophysiology of Ischemic Heart Disease
# Workshop

## October 2-4, 2002

## Session 3

**1. Topic and Author**

Presentation of Acute Cardiac Ischemia in Women in the Emergency Department
Author: Harry P. Selker, MD

**2. Where we stand in 2002.** Overview/rationale for inclusion of topic.

Although the emergency department (ED) presentation of acute cardiac ischemia (ACI: including acute myocardial infarction [AMI] and unstable angina pectoris) in women has characteristics similar to that in men, there is less dominance of a primary complaint of chest pain over shortness of breath, and with AMI, there is more often complicating congestive heart failure (CHF). Also, women present at more advanced ages, with more pre-existing diabetes, hypertension, and CHF, but less frequently with a history of AMI, and with different implications of classical coronary artery disease (CAD) risk factors. Accordingly, women, along with other ED patients with ACI with less clearly typical presentations, are those more likely to have their diagnosis of ACI missed in the ED and be sent home, and are less likely to receive coronary reperfusion treatments (thrombolytic therapy or primary angioplasty) for AMI.

**3. Current challenges and the most important issues for future research**

The primary challenge is for further detailed clinical data on the presentation of ACI/AMI to ensure that we have an accurate and complete understanding, not just in the ED, but over the entire first and ensuing hours following ACI onset. A challenge to this will be to avoid the incomplete inclusion of all patients with the full range of symptoms of ACI, and particularly of women, that has limited the findings and generalizability of many clinical studies and trials. There also remain significant misunderstandings in the use of diagnostic technologies for ACI in the ED, and these affect diagnosis of ACI in women (and men); continuing efforts to improve diagnostic tests and the understanding of their use are needed. An additional challenge will be to better understand the related presentations in women not due to classic CAD that may present with a different array of symptoms and of diagnostic findings than classic CAD-based ACI.

**4. Current challenges in the areas of communicating messages to health care community, patients and the public**

The healthcare community, patients, and the public at large all need to have better understanding of the presentation of ACI. Additionally, for the public, based presumably on further data, there is a need to educate on the earliest presentations of ACI, and on ACI as a process that needs intervention, as opposed to a focus only on classic AMI. Also, despite efforts of the NIH NHAAP, there remains a need to further educate the clinical community on the optimal use of diagnostic technologies for ACI, including the development of better ways to assist the diagnostic process.

**5. Translating new findings to improved diagnosis and treatment/saving lives.**

Although data that address the above issues will be critical, by themselves, this will not be sufficient to have impact and save lives. Rather, based on this better understanding of the presentation of ACI, there needs to be development and testing of ways to improve the timeliness and accuracy of diagnosis of ACI, and demonstration of their impact on emergency care and clinical outcomes.

**6. References.**


1. Zucker DR, Griffith JL, Beshansky JR, Selker HP. Presentations of acute myocardial infarctions in men and women: Results from a prospective, multicenter study. J Gen Intern Med, 12:79-87, 1997.
2. Pope JH, Aufderheide TP, Ruthazer R, Woolard RH, Feldman JA, Beshansky JR, Griffith JL, Selker HP. A

multicenter prospective study of missed diagnoses of acute myocardial infarction and unstable angina pectoris in the emergency department. N Engl J Med, 342:1163-70, 2000.
3. Jayes RL, Beshansky JR, D'Agostino RB, Selker HP. Do patients' coronary risk factors predict acute cardiac ischemia in the emergency room? J Clin Epidemiol, 45:621-626, 1992.
4. Coronado BE, Griffith JL, Beshansky JR, Selker HP. Hospital mortality in women and men with acute cardiac ischemia: A prospective multicenter study. J Am Coll Cardiol, 29:1490-1496, 1997.
5. Maynard C, Selker HP, Beshansky JR, Griffith JL, Schmid CH, Califf RM, D'Agostino RB, Laks MM, Lee KL, W GS, Weaver WD. The exclusion of women from clinical trials of thrombolytic therapy: Implications for develop the thrombolytic predictive instrument. Med Decis Making, 15:38-43, 1995.
6. Maynard C, Beshansky JR, Griffith JL, Selker HP. The influence of sex on the use of cardiac procedures in patients presenting to the emergency department: A prospective multicenter study. Circulation, 94:93-98, 1996.
7. Tobin JN, Wassertheil-Smoller S, Wexler JP, Steingart RM, Budner N, Lense L, Wachpress J. Sex bias in considering coronary bypass surgery. *Ann Intern Med.* 1987;107:19-25.
8. Ayanian JZ, Epstein AM. Differences in the use of procedures between women and men hospitalized for coronary heart disease. *N Engl J Med.* 1991;325:221-225.
9. Steingart RM, Packer M, Hamm P, Coglianese ME, Gersh B, Geltman EM, Sollano J, Katz S, Moye L, Basta LL, Lewis SJ, Gottlieb SS, Bernstein V, McEwan P, Jacobson K, Brown EJ, Kukin ML, Kantrowitz NE, Pfeffer MA. Sex differences in the management of coronary artery disease. *N Engl J Med.* 1991;325:226-230.
10. Maynard C, Althouse R, Cerqueira M, Olsufka M, Kennedy JW. Underutilization of thrombolytic therapy in eligible women with acute myocardial infarction. *Am J Cardiol.* 1991;68:529-530.
11. Krumholz HM, Douglas PS, Lauer MS, Pasternak RC. Selection of patients for coronary angiography and coronary revascularization early after myocardial infarction: is there evidence for a gender bias? *Ann Intern Med.* 1992;116:775-790.
12. Bicknell NA, Pieper KS, Lee KL, Mark DB, Glower DD, Pryor DB, Califf RM. Referral patterns for coronary artery disease treatment: gender bias or good clinical judgment? *Ann Intern Med.* 1992;116:791-797.
13. Maynard C, Litwin PE, Martin JS, Weaver WD. Gender differences in the treatment and outcome of acute myocardial infarction. *Arch Intern Med.* 1992;152:972-976.
14. Chiriboga DE, Yarzebski J, Goldberg RJ, Chen Z, Gurwitz J, Gore JM, Alpert JS, Dalen JE. A community wide perspective of gender differences and temporal trends in the use of diagnostic and revascularization procedures for acute myocardial infarction. *Am J Cardiol.* 1993;71:268-273.
15. Pagley PR, Yarzebski J, Goldberg R, Chen Z, Chiriboga D, Dalen JE, Gurwitz J, Alpert JS, Gore JM. Gender differences in the treatment of patients with acute myocardial infarction: a multihospital, community-based perspective. *Arch Intern Med.* 1993;153:625-629.
16. Behar S, Gottlieb S, Hod H, Narinsky R, Benari B, Rechavia E, Pauzner H, Rougin N, Kracoff OH, Katz A, Roth A, Goldhammer E, Rudnik L, Faible HE, Lotan C, Shapira C, Jafari J, Freedberg NA, Daka F, Kanetti M, Weiss T, Barasch E, Klustein M, Blondheim D, Mahul N, Gelvan A, Barbash G. Influence of gender in the therapeutic management of patients with acute myocardial infarction in Israel. *Am J Cardiol.* 1993;73:438-443.
17. Clarke KW, Gray D, Keating NA, Hampton JR. Do women with acute myocardial infarction receive the same treatment as men? *BMJ.* 1994;309:563-566.
18. Kostis JB, Wilson AC, O'Dowd K, Gregory P, Chelton S, Cosgrove NM, Chirala A, Cui T. Sex differences in the management and long-term outcome of acute myocardial infarction. *Circulation.* 1994;90:1715-1730.
19. Mark DB, Shaw LK, DeLong ER, Califf RM, Pryor DB. Absence of sex bias in the referral of patients for cardiac catheterization. *N Engl J Med.* 1994;330:1101-1106.
20. Funk M, Griffey KA. Relation of gender to the use of cardiac procedures in acute myocardial infarction. *Am J Cardiol.* 1994;74:1170-1173.
21. Vaitkus PT. Gender differences in the utilization of cardiac catheterization for the diagnosis of chest pain. *Am J Cardiol.* 1995;75:79-81.
22. Maynard C, Martin JS, Hallstrom AP, Weaver WD. Changes in the use of thrombolytic therapy in Seattle area hospitals from 1988 to 1992. *J Thromb Thrombol.* 1995;1:195-199.
23. Pope JH, Ruthazer R, Beshansky JR, Griffith, JL, Selker HP. Clinical features of emergency department patie presenting with symptoms suggestive of acute cardiac ischemia: A multicenter study. Journal of Thrombosis Thrombolysis, 6:63-74, 1998.
24. Maynard C, Beshansky JR, Griffith JL, Selker HP. Causes of chest pain and symptoms suggestive of acute c ischemia in African-American patients presenting to the Emergency Department: a multicenter study. *J Natl M*

*Association*. 1997;89:665-671.
25. Reis SE, Holubkov R, Conrad-Smith AJ, Kelsey SF, Sharaf BL, Reichek N, Rogers WJ, Merz CN, Sopko G, Pepine CJ. Coronary microvascular dysfunction is highly prevalent in women with chest pain in the absence of coronary artery disease: Results from the NHLBI WISE study. *Am Heart J*, May 2001.
26. Buchthal SD, Den Hollander JA, Merz CN, Rogers WJ, Pepine CJ, Reichek N, Sharaf B, Reis S, Kelsey S, Pohost GM. Abnormal Myocardial Phosphorus-31 Nuclear magnetic resonance spectroscopy in women with chest pain but normal coronary angiograms. *NEJM.* 342;12:829-835.
27. Selker HP; Beshansky JR; Griffith JL; For the TPI Trial Investigators. Use of the electrocardiograph-based thrombolytic predictive instrument to assist thrombolytic and reperfusion therapy for acute myocardial infarctic multicenter randomized clinical effectiveness trial. *Ann Intern Med,* 2002, 137:87-95.
28. Selker HP, Griffith JL, Beshansky JR, Schmid CH, Califf RM, D'Agostino RB, Laks MM, Lee KL, Maynard C, Selvester RH, Wagner GS, Weaver WD. Patient-specific predictions of outcomes in myocardial infarction for real-time emergency use: A thrombolytic predictive instrument. *Ann Intern Med*, 127:538-556, 1997.
29. Ornato JP, Selker HP, Zalenski RJ. Overview: Diagnosing acute cardiac ischemia in the emergency department. A report from the National Heart Attack Alert Program. *Ann Emerg Med*, 37:450-452, 2001.